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A MIDGET SUPERHET WITH RV SERIES TUBES

Milobar Boridar

Although nowadays it is extremely difficult to obtain materials for constructing radio sets, especially tubes, it is nevertheless possible, using material available in our country, to construct midget sets which are in no way inferior to the factory product.

The tubes used are those of the RV series, the supply of which is sufficient for our amateurs. As this series has no combined mixer and oscillator tubes it is necessary to use two tubes for this purpose.

The RV 12 P 2001 is used for the mixer tube. This differs from the RV 12 P 2000 in having an exponential characteristic, but it is possible to introduce antifading regulation (AVC) into it.

The RV 12 P 2000 is used for the oscillator. Its second and third grids are connected to the plate and, at the same time, to the second grid of the RV 12 P 2001 tube, the oscillator being thus linked with the mixer tube. The oscillator operates in the usual Meissner parallel connection.

The type of coil used is suitable for short and medium waves. The wave switch has four poles, and two positions. When receiving short waves, all the poles are closed and the medium wave coil is short-circuited.

The medium wave coils are on H. F. iron cores and those for short waves on cylinders 2 centimeters in diameter. The RV 12 P 2001 serves as an intermediate frequency amplifier, again due to its exponential characteristic.

The next RV 12 P 2000 tube has a dual purpose, acting as a demodulator and as an audio amplifier.

The plate of this tube serves as the diode plate and one end of the coil of the second I. F. transformer is connected to it. The other end of the coil is connected across a 0.3 megohm resistance to the cathode of the tube and through a resistance of 0.1 megohm and a 10,000 mmfd condenser to a potentiometer for volume control.

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The AVC voltage is taken from this end of the coil and is applied to the first tube only for medium waves, and on the third tube for both reception bands.

The second grid of the RV 12 P 2000 tube serves as the triode plate and from it is taken the amplified audio signal leaving the tube. The condensers C-14 and C-18 serve to remove the remnants of the H. V. voltage which is prevented from reaching the output tube.

An American 8-watt 12 A 6 pentode is used as the output tube. When supplied with 250 volts, it can give 3.5 watts of useful power.

The power transformer has no separate plate winding, but the voltage on the primary side, by the auto-transformer principle is stepped up to 270 volts.

Since the set is directly connected to the electric power line the antenna is connected through the condenser C-24 which has a high breakdown voltage.

Rectification is accomplished by means of an RG 12 D 60 tube. It has two plates which are interconnected. The resistance R-19 serves as protection from a shock current which might damage the set.

The plate is connected to the chassis through a 10,000 mmfd condenser in order to eliminate hum in the set. The working voltage amounts to 225 volts.

As regards sensitivity, the set is in no way inferior to manufactured midgets and its power consumption is less than half. The total power consumption with losses is 25 watts. The dial is taken from any old midget set and the stations are approximately adjusted to their own places. The set is mounted on a pertinax board which stands on two okonite boards at the side. The tubes are not in sockets but are attached to the chassis with short screws.

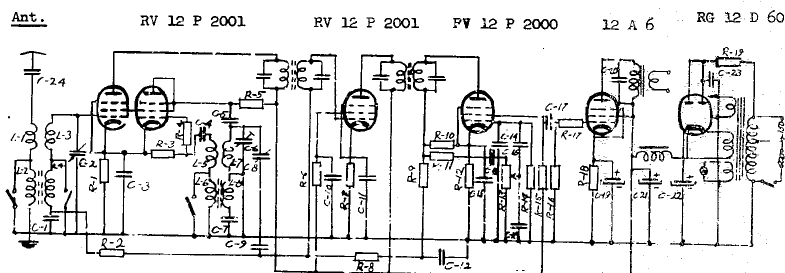
The I. F. tube is of necessity shielded, whereas the others need not be. The de-modulator and the audio tube are located under the chassis. To the left of the dial a small permanent magnet dynamic loudspeaker is secured to the chassis. On the right hand side there is a knob for moving the scale and the wave switch, and to the left a potentiometer for regulating the volume with a power switch.

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Superhet with following tubes: 2-RV 12 P 2000, 2-RV 12 P 2001, 1-12 A 6, 1-RG 12 D 60. I. F. = 468 Kc.

RV 12 P 2000



c-1 = 5000 mmfd
c-2 = c-3 = 2 x 500 mmfd
c-3 = 0.1 mfd
c-4 = 100 mmfd
c-5 = 1000 mmfd
c-6 = 3-30 mmfd (trimmer)
c-7 = 500 mmfd 2 1/2
c-9 = 0.05 mfd
c-10 = 0.1 mfd
c-11 = 0.1 mfd
c-12 = 0.025 mfd
c-13 = 10 mfd/12V
c-14 = 200 mmfd
c-15 = 0.01 mfd

c-16 = 0.01 mfd
c-17 = 0.02 mfd
c-18 = 100 mmfd
c-19 = 25 mfd/25V
c-20 = 5000 mmfd
c-21 = 16 mfd/350V
c-22 = 3 mfd/350V
c-23 = 0.01 mfd
c-24 = 5000 mmfd/1500V
R-1 = 500 ohms
R-2 = 1 megohm
R-3 = 20 kilohms
R-4 = 150 ohms
R-5 = 50 kilohms/1W

R-6 = 0.2 megohm
R-7 = 1 kilohm
R-8 = 1 megohm
R-9 = 1 megohm
R-10 = 0.3 megohm
R-11 = 0.1 megohm
R-12 = 1 kilohm
R-13 = 1 megohm pot.
R-14 = 1 megohm
R-15 = 0.1 megohm
R-16 = 0.7 megohm
R-17 = 1 kilohm
R-18 = 300 ohms
R-19 = 250 ohms/1W

Choke Coil

core cross-section -- 4cm²
ohmic resistance -- 260 ohms
wire -- 0.18 to 0.20 mm

Power Transformer

core cross-section -- 5cm²
primary:
220 V, 1900 turns -- 0.18 mm
50V, 420 turns -- 0.18 mm
secondary:
12.6 V, 115 turns, 0.3 mm
12.6 V, 115 turns, 0.7 mm
2.5 V, 22.5 turns, 0.4 mm

[Photograph of receiver and table for winding RF coils are not reproduced but are available in the original document in CIA.]